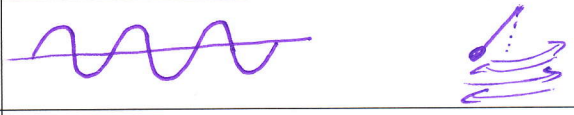
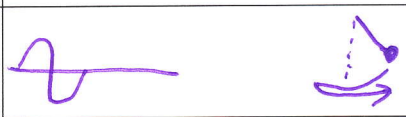
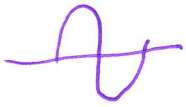
Waves Vocabulary

Term	Definition	Picture
Wave	A physical mechanism that permits energy to travel from one point to another point	
Medium	The material through which a mechanical wave travels	----------
Electromagnetic Wave	A transverse wave that does not require a medium through which to travel. Examples include X-rays, Radio waves and light waves.	----------
Mechanical wave	A wave that requires a medium through which to travel. Examples include water waves, sound waves	----------
Wave motion	The motion of the wave, as opposed to particle vibration	----------
Particle motion	The movement of particles affected by the passage of a wave. This motion is not necessarily in the same direction as the motion of the wave. As water waves move, the water itself moves up and down. As a wave crest approaches, the water nearby moves toward the crest, providing a source of matter for the upward movement, but that water moves back as a trough approaches, so there is no net movement in the direction of the wave. In sound waves, the particles move back and forth in the direction of the wave motion.	
Pulse wave	A wave that consists of a single traveling pulse or disturbance	
Periodic Motion	A wave that repeats itself in equal intervals of time.	
Harmonic Motion	A wave that displaced from an equilibrium position that experiences a force to return to the equilibrium position	
Cycle	One complete oscillation	
Transverse wave	A wave whose particles vibrate in a direction perpendicular to the direction of wave motion. Water waves are transverse waves.	

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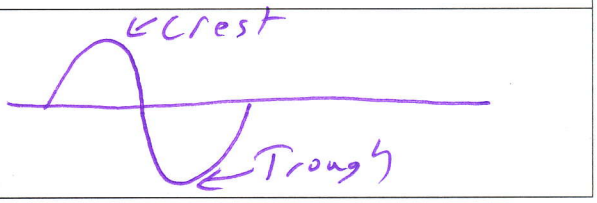
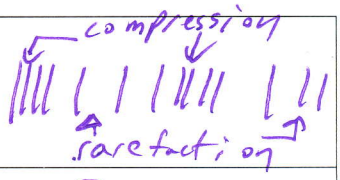
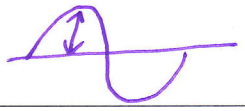
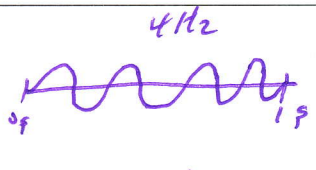
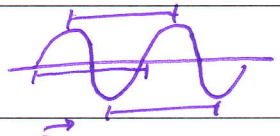
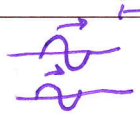
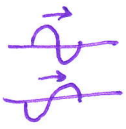
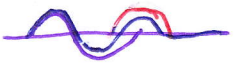
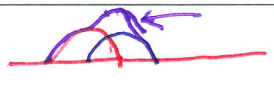
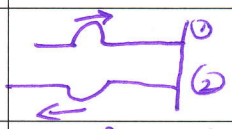
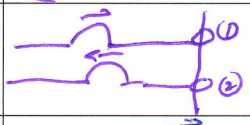
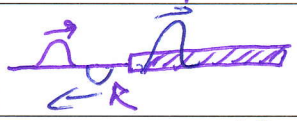
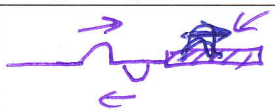
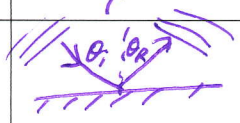
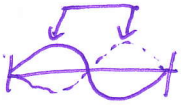
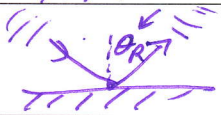
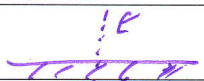
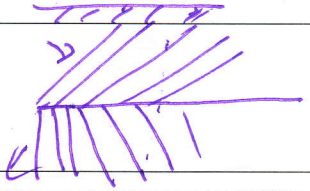
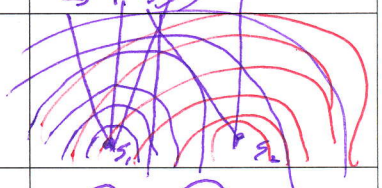
Term	Definition	Picture
Longitudinal wave	A wave whose particles vibrate parallel to the direction of wave motion. Sound waves are longitudinal waves. Stretched springs can support either longitudinal or transverse waves.	
Crest	The highest point of a wave above the equilibrium position in a transverse wave.	
Trough	The lowest point of a wave below the equilibrium position in a transverse wave.	
Compression	The compressed part of a longitudinal wave.	
Rarefaction	The expanded part of a longitudinal wave	
Amplitude	The maximum displacement of particles from their equilibrium position	
Period	The time it takes for one complete cycle of wave motion to pass a fixed point, usually shown as a capital T	
Frequency	The number of cycles of a periodic wave per unit time. Usually shown as a lower case letter *f*. Mathematically, the frequency is the inverse, or reciprocal, of the period. That is: $f = \frac{1}{T}$ or $T = \frac{1}{f}$	
Wavelength	The distance between adjacent crests or troughs, usually shown as the Greek letter lambda, (λ)	
In Phase	Two waves are in phase if they have the same fractional displacement from the rest position and are moving in the same direction	
Out of Phase	Two waves are out of phase if the waves have different fractional displacement from the rest position or are not moving in the same direction	
Universal Wave Equation	$v = f\lambda$	----------
Wave Interference	Interference that occurs through superposition when two or more waves act simultaneously on a medium	
Constructive Interference	Occurs when the resulting disturbance is greater than the individual disturbances that created it	

Waves Vocabulary

Term	Definition	Picture
Destructive Interference	Occurs when the resulting disturbance is less than the individual disturbances that created it	
Fixed-end Reflection	A pulse hitting a barrier that results in an inverted pulse	
Free-end Reflection	A pulse hitting a barrier that results in an upright pulse	
Partial Reflection	When a wave travels from one medium to another medium, a part of the wave will be reflected	
Transmission	When a wave meets the boundary of one medium and passes through into a second medium	
Boundary	The end of the medium, for example, when light passes from the medium of air to the medium of glass.	
Law of Reflection	When a wave strikes a straight barrier the reflected wave will have the same angle as the incident wave	
Node	Areas of maximum destructive interference	
Anti-node	Areas of maximum constructive interference. Located half-way between nodes	
Standing Wave Pattern	A wave pattern that occurs when two waves of the same frequency, wavelengths and amplitude travel in opposite directions and interfere with each other. Standing waves occur in musical instruments, like violins, as well as other places where waves are reflected.	
Incident Angle	The angle between the ray striking the barrier and the normal	
Reflected Angle	The angle between the ray leaving the barrier and the normal. The angle of incidence equals the angle of reflection, according to the Law of reflection.	
Normal	An imaginary line that is perpendicular to every point on a barrier	
Refraction	The bending of a wave when it passes from one medium into another. Refraction is caused by the fact that the wave speed is different in the two media. As the wave passes from one medium to the other the frequency remains the same but the wavelength changes.	
Dispersive Medium	Wave speed depends on the frequency. Higher frequency waves are refracted slightly differently than lower frequency waves.	---------- ---------- ----------

Waves Vocabulary

Term	Definition	Picture
Diffraction	Bending that occurs when a wave passes the edge of an obstacle	
Interference Pattern	Symmetrical pattern of nodal lines and anti-nodal lines produced by two point sources vibrating in phase	
Phase shift	When waves go up and down together, they are in-phase. When one goes up when the other goes down, they are out of phase. Two waves of the same frequency are out of phase when their starting points are different by one half of one wavelength. Mathematically, this is 180 degrees or π radians.